

ABSTRACT OF THE DISCLOSURE

5 An apparatus for heating a fluid in a process having a process heat requirement includes a shell, at least one tube having a design temperature inside the shell, a plurality of burners adjacent the inner wall of the shell, and transfer means whereby flue gas flows from a first interior region to a second interior region of the shell. A first portion of the tube is in the first interior region and a second portion of the tube is in the second interior region. The first and second portions of the tube are adapted to contain a flow of the fluid. The burners produce the flue gas in the first interior region and a variable heat flux approximating the process heat requirement and simultaneously maximizing the heat flux to the first portion of the tube while maintaining substantially all of the first portion of the tube at the design temperature.

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